

REMARKS

The Office Action mailed on May 11, 2004, is acknowledged. Applicant requests reexamination of the above-mentioned application in view of the following remarks.

Claim Rejections - 35 U.S.C. § 102

The Examiner rejects claim 1 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,521,437 to Oshima et al. (hereinafter referred to as "Oshima"). Specifically, the Examiner asserts that Oshima teaches a device including:

- a power part of the electronic components of which are arranged on a power substrate, [(]for example, see elements 221, 222, T1-T6, Figs 1A, 4-22)
- a logic part of the components of which are arranged on a circuit board having a recess in which the power pad is located and electrically connected to the logic pad by means of wire bonding techniques (for example, see elements 170, 172, IC1-IC6, W Figs 1A, 4-22)
- the power substrate being mounted on a cooling plate, (for example, see element 162, 163, Figs 1A, 4-22)
- wherein a first portion of the circuit board is mounted on and in thermal connection with the cooling plate, the first portion surrounding the power substrate (for example, see elements 170, 163 Figs 1C, 4, 17, 20)
- and a second portion of said circuit board supporting at least one component forming said logic part which is not mounted on the cooling plate (for example, see elements 170, 172, 162, IC1-IC6, W Figs 1C, 4, 17, 20).

Applicant respectfully disagrees with this assertion.

Pending claim 1 claims an intelligent power module in which the logic components are arranged on a circuit board having a recess. Pending claim 1 further requires that a power part be positioned within the recess. Oshima fails to teach this limitation.

With respect to Oshima, the Examiner asserts components 170, 172 IC1-IC6 and W represent logic components arranged on a circuit board, and numerals 221, 222, T1-T6 represent power components arranged on a power substrate. The Examiner further asserts that the circuit board supporting the logic components includes a recess in which the

power part is located. Applicant believes the Examiner is mistaken in this assertion, and the logic part does not include a logic component for receiving the power part.

In Oshima, the composite board 150 includes an insulating metallic board 160, an insulating board 170 and a frame 180, as shown in Figures 4-22, for example. The frame 180 retains the two insulating boards 160, 170, thereby forming one integral composite board. The power part components are arranged on the metallic insulating board 160, and the logic part components are arranged on the insulating board 170. "The frame 180 includes two openings which are located close to each other." See Oshima, column 10, lines 35-36. Moreover, "[T]he insulating metallic board 160 and the insulating board 170 are engaged with openings of the frame 180 *so as to be arranged adjacent each other.*" See Oshima, column 10, lines 22-25 (emphasis added). Accordingly, the insulating board 170 does not include a recess for receiving the metallic insulating board 160 of the power part, because the boards 160, 170 are arranged adjacent each other. Oshima does not teach the limitation of claim 1 that requires the logic part to include a recess for receiving the power part, and therefore Oshima does not anticipate claim 1.

Nor would it be obvious to one of ordinary skill in the art to modify the insulating board 170 of Oshima to include a recess sized to receive the metallic insulating board 160. The invention of Oshima is specifically directed toward the utilization of a frame 180 with adjacent apertures. The combination of the boards 160, 170 and the frame 180 represents a single composite board 150. Oshima teaches, "it is possible to treat the composite board 150 which is comprised of the two different types of boards simply as one board, which in turn reduces a manufacturing cost of the device 100 as described later." See Oshima, column 11, lines 37-40. Moreover,

Unlike in the conventional circuit board 10 (FIG. 23) in which one board is superimposed on the other board, the insulating metallic board 160 and the insulating board 170 are arranged parallel next to each other in the frame 180. Since this eliminates a wasteful use of the expensive composite board 150, the composite board 150 is manufactured cheaper than the conventional circuit board 10.

See Oshima, column 11, lines 39-47. Accordingly, one skilled in the art would have no reason to add a recess to the logic board of Oshima in order to receive the power parts.

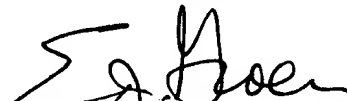
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Amdt. Dated October 12, 2004
Reply to Office Action of May 11, 2004

For the forgoing remarks, Applicant believes claim 1 is allowable over Oshima since claim 1 includes limitations not taught in the prior art. Moreover, since claims 2-6 ultimately depend from claim 1, Applicant further asserts these claims are also allowable over the art.

CONCLUSION

Applicant has fully responded to the Office Action above. Applicant believes all of the pending claims are now in condition for allowance, and respectfully requests passage thereof. If necessary to effect a timely response, please consider this paper a request for an extension of time, and charge any shortages in fees, or apply any overpayment credits, to Baker & Daniels' Deposit Account No. 02-0387 (72262.90020). However, please do not include the payment of issue fees.

Respectfully submitted,

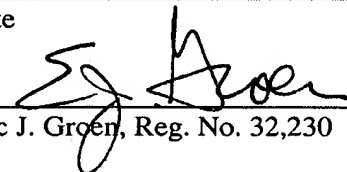


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I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

October 12, 2004

Date



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